



**REVIEW AND ANALYSIS OF STATUS OF IMPLEMENTATION OF
WASTEWATER STRATEGIES AND/OR ACTION PLANS
NATIONAL REPORT- EGYPT**

**Work package (WP1) «Water Governance and
Mainstreaming» - Activity 1.1.2**

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The SWIM Programme (2010 – 2014)

Contributing to Sustainable Water Integrated Management in the Mediterranean

Funded by the European Commission with a total budget of approximately € 22 million, Sustainable Water Integrated Management (SWIM) is a Regional Technical Assistance Programme aiming to contribute to the effective implementation and extensive dissemination of sustainable water management policies and practices in the South-Eastern Mediterranean Region in view of increasing water scarcity, combined pressures on water resources from a wide range of users, desertification processes and in connection with climate change.

The SWIM Partner Countries (PCs) are: Algeria, Egypt, Israel, Jordan, Lebanon, Libya¹, Morocco, the occupied Palestinian territory, Syria and Tunisia.

SWIM aligns with the outcomes of the Euro-Mediterranean Ministerial Conferences on Environment (Cairo, 2006) and Water (Dead Sea, 2008) and also reflects on the four major themes of the draft Strategy for Water in the Mediterranean (SWM), mandated by the Union for the Mediterranean, namely: Water Governance; Water and Climate Change; Water Financing and; Water Demand Management and Efficiency, with particular focus on non-conventional water resources. Moreover, it is operationally linked to the objectives of the Mediterranean Component of the EU Water Initiative (MED EUWI) and complements the EC-financed Horizon 2020 Initiative to De-Pollute the Mediterranean Sea (Horizon 2020). Furthermore, SWIM links to other related regional processes, such as the Mediterranean Strategy for Sustainable Development (MSSD) and the Arab Water Strategy elaborated respectively in the framework of the Barcelona Convention and of the League of Arab States, and to on-going pertinent programmes, e.g. the UNEP/MAP GEF Strategic Partnership for the Mediterranean Large Marine Ecosystem (MedPartnership) and the World Bank GEF Sustainable Mediterranean.

The Programme consists of two Components, acting as a mutually strengthening unit that supports much needed reforms and new creative approaches in relation to water management in the Mediterranean region, aiming at their wide diffusion and replication.

The two SWIM Components are:

- A Support Mechanism (SWIM-SM) funded with a budget of € 6.7 million and
- Five (5) Demonstration Projects funded with a budget of approximately € 15 million

For more information please visit <http://www.swim-sm.eu/> or contact info@swim-sm.eu

¹ The situation in spring 2012 is that following formal EC decision activities have been stalled in Syria while Libya has officially become a Partner Country of the SWIM Programme



Preamble

Within the scope of Work Package 1 (WP1) "Water governance and mainstreaming"; Activity 1.1.2, the EU-funded Sustainable Water Integrated Management – Support Mechanism (SWIM-SM) Project implemented a study for the review and analysis of the development and implementation status of wastewater strategies and/or action plans in three project countries (Egypt, Morocco and Tunisia).

The assessment in the three countries was based on existing studies/documents and country missions that took place during the last quarter of 2012 and aimed at (a) illustrating the status of development and implementation of wastewater strategies, plan of actions and associated policies; (b) identifying achievements and success stories; (c) examining constraints and challenges; (d) identifying opportunities for advancing missing priority elements in the development and implementation efforts and (e) suggesting recommendations and proposed policy options to enhance the development and integration of wastewater national strategies into national water plans.

The assessment was followed by a one-day national consultation workshop, in each country (Tunisia: 6 March 2013, Morocco: 8 March 2013, and Egypt 11 March 2013) involving all stakeholders, who reviewed and validated the findings of the assessment and provided guidance to the project to ensure that the proposed priorities, policy options and recommendations address the country's current and future needs. The workshop also provided a platform for facilitating national dialogue among high level officials from the relevant sectors to advance the strategy/policy/action plan formulation and implementation in the respective countries.

This report pertains to the assessment that was made for Egypt.



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Our appreciation is also due for the national representatives and experts who participated in the National Consultation Workshop held in Cairo on March 11th, 2013, and enriched the assessment with their insights, experience and active participation. See Annex 1.

Disclaimer:

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Executive summary

In North Africa, Egypt has strong features that govern water resources and their use, while the country is mostly composed of deserts and only the delta and a narrow strip of land are cultivated along the Nile. The population (mostly rural) is significant and concentrated in the fertile area and two large mega cities (Cairo and Alexandria), whereas the desert climate does not allow to have renewable territorial water resources and the Nile (whose flow starts in the upstream countries) is the essential resource of the country. The country's water stress is steadily increasing due to the significant growth of the population. Agriculture can only be developed through irrigation. The **quality of the Nile water and other surface water (drainage systems)** is undergoing sharp deterioration due to anthropogenic pressures. This explains the strategies and policies of the State which are primarily oriented to the management and protection of the resource.

The Egyptian Government has displayed a **strategy** of water management on the basis of Integrated Water Resources Management (IWRM) including demand management. However, **water management** remains highly **centralized**, with no extensive involvement of users (therefore, a "top - down management") and is **sectorial**. **Four main ministries share the responsibility for the management of water and sanitation** the Ministry of Water Resources and Irrigation (**MWRI**) in charge of developing and managing the resources (surface and groundwater quantity and irrigation), the Ministry of State for Environmental Affairs (**MSEA**) in charge of protecting the water resources and the environment, the Ministry of Water and Wastewater Utilities (**MWWU**) in charge of drinking water and sanitation and the Ministry Of Health and Population (**MOHP**) in charge of public health (quality control). Alongside these core ministries, other ministries may be involved according to their specificity. This is particularly the case for the Ministry of Finance that is managing investments, budgets and subsidies paid to companies. Along with the above ministries, **several agencies and organizations have been established to implement government policies**, such as the Egyptian Environmental Affairs Agency (**EEAA**), the Egyptian Water and Wastewater Regulatory Agency (**EWRA**), the National Organization for Potable Water and Sanitary Drainage (**NOPWASD**), the Construction Authority for Potable Water and Wastewater (**CAPW**), the National Water Research Center (**NWRC**), to name the main ones. In the sanitation sector creating the Holding Company for Water and Wastewater (**HCWW**) and the affiliated Companies (ACs) under HCWW's responsibility, brought together the management of drinking water supply and sanitation under one single entity.

The particular situation in Egypt (hydrological, geo-climatic as well as socio-economic) has prompted the Government to focus for decades on the water resources and their protection. **A proactive policy to supply the population with safe drinking water has been successful in supplying almost all of the population with drinking water, including a large part of the rural areas.** Protection of the resources has resulted in a policy of sanitation development in urban areas and most cities are equipped with the respective facilities. However, the deficit remains very important in rural areas for the sector (the programs for this sector continue to lag far behind).

The involvement of Ministries and agencies is through a well-developed institutional and regulatory framework although some areas are still deficient, such as the case of rural sanitation, reuse of treated wastewater (TWW) and the treatment of industrial waste. Egypt does not have a general law for water but a number of sectorial laws under which fall all decrees governing the



sector. Development in recent decades, has led to the ongoing restructuring/revisiting of some of these laws.

Intervention policies and their implementation are through several plans and programs, including mid- or long-term strategies. **Egypt receives extensive financial support** from international donors (European Union (EU), African Development Bank (ADB), European Investment Bank (EIB), Agence Française de Développement (AFD); Kreditanstalt für Wiederaufbau (KfW); Japan International Cooperation Agency (JICA); World Bank (WB)...) for investments, capacity building and studies through various programs (Water Sector Reform Program (WSRP), Improved Water and Wastewater Services Program (IWSP), the Gesellschaft für Technische Zusammenarbeit (GIZ) Water & Wastewater Management Program ...).

However, analysis of the current situation reveals a number of weaknesses and gaps in the sanitation sector, which undermine the country's effort towards effective integrated water resources management.

- In **rural areas, the development of sanitation is significantly lagging** behind compared to the urban sanitation. This is partly due, on the one hand, to the lack of a clear institutional framework for sanitation in rural areas and an efficient implementation of a National Rural Sanitation program that defines the types of technical interventions and the appropriate financial framework, and on the other hand is due to the lack of information, training and involvement of users and stakeholders.
- **In the sector of TWW reuse**, displayed as a priority by the Government as a significant unconventional resource, the **current situation does not facilitate its development** due to the unclear institutional situation, very restrictive standards, lack of technical training, additional treatment costs and distribution networks, insufficient information to potential users, and uncertainty about the quality of the distributed water. The level of effluent treatment and the relatively low performance of the Wastewater treatment plants (WWTPs) render the situation even more challenging.
- The situation regarding the **fate of sewage sludge** requires a number of clarifications. While several pilot sites have been implemented, it seems necessary to clarify a number of issues such as the role of institutional managers and users as well as their mutual relations, their fields of action and responsibilities. To be of value, **sludge requires a composition that is compatible with their use and imposing stronger technical constraints and a policy to control the quality of discharges** (upstream of the WWTPs) entering the sewerage networks (policy for industrial discharges).
- Solving the problem of industrial discharges, their impact and their treatment is crucial in order to make better use of wastewater (WW) and sludge from the WWTPs. The institutional framework for industrial WW discharges is currently inadequate (discharge standards by type of activity is required). On the other hand the polluter – pays principle is not applied. An effective strategy to solve the problem of industrial activities and water management need to be developed and put in place as soon as possible so as not to block certain sectors' activities (WWTP operation, WW reuse and sludge reuse).



- The complexity of the sanitation sector in terms of investments requires reconsideration of the sector's governance and a greater autonomy *vis-à-vis* the Central Government. This is also true regarding the data acquisition systems and the management of databases that are currently incompatible, inefficient and difficult to use.
- **Participative management** in the water sector in Egypt is **little** or not developed. Ongoing reforms, as well as the situation of the post-revolutionary transition, present an opportunity to develop this approach through decentralization and users' participation. The redesign of basic texts (review of laws and new laws in particular) should take this dimension into account, which is a basis for the demography-oriented functioning of institutions (to take into account the concentration of population).
- Other areas present also some weaknesses: for example, the **tariff on sanitation is insufficient** and **does not cover the cost of operation** (creating difficulties for HCWW and AC). The possibilities for private sector to participate are relatively limited and should be facilitated. The multiplicity of sanitation strategies (there is no single and agreed upon National Water strategy), programs, action plans could be simplified for the benefit of horizontal policies which are essential for the integrated management of water resources.

In conclusion, **the analysis of the current situation of the water sector in Egypt, particularly with regard to sanitation**, revealed a number of areas where progress can be made:

- Participative management with users and stakeholders' involvement
- Decentralization of water management and sanitation
- Sanitation in rural areas
- The reuse of wastewater and its institutional framework and planning
- The treatment of industrial waste and its institutional framework
- Pricing of services
- The WWTP sludge management and reuse including institutional and technical framework
- Overall improved governance framework for the sanitation sector
- Monitoring strategy, data collection and databases management in the water sector
- Higher level of WW treatment, rehabilitation of existing and investment in new WWTP



List of Acronyms

AC	Affiliated Company
AFD	Agence Française de Développement
ADB	African Bank of Development
BCM	Billion cubic meters
BOT	Build, Operate, and Transfer
CAPW	Construction Authority for Potable Water and Wastewater
ECP	Egyptian Code of Practice
EEAA	Egyptian Environmental Affairs Agency
EIB	European Investment Bank
EU	European Union
EWRA	Egyptian Water and Wastewater Regulatory Agency
GDP	Gross Domestic Product
GEAP	Governorate Environmental Action Plan
GIS	Geographic Information System
GIZ	Gesellschaft für Internationale Zusammenarbeit
GTZ	Gesellschaft für Technische Zusammenarbeit
HCW	Higher Committee for Water
HCWW	Holding Company for Water and Wastewater
ISSIP	Integrated Sanitation and Sewerage Infrastructures Project
IWRM	Integrated Water Resources Management
IWSP	Improved Water and Wastewater Services Program
ISEW	Institutional Strengthening to EWRA
JICA	Japan International Cooperation Agency
KFW	Kreditanstalt für Wiederaufbau
MALC	Ministry of Agriculture and Land Cultivation
MED EUWI	Mediterranean Component of the EU Water Initiative
MOHP	Ministry Of Health and Population
MSEA	Ministry of State for Environmental Affairs
MWRI	Ministry of Water Resources and Irrigation
MWWU	Ministry of Water and Wastewater Utilities



NEAP	National Environmental Action Plan
NGO	Non-Governmental Organisation
NL	Netherlands
NOPWASD	National Organization for Potable Water and Sanitary Drainage
NWRC	National Water Research Center
NWRP	National Water Resources Plan
SADS	Sustainable Agricultural Development Strategy
SNMP	Strategic National Master Plan
TWW	Treated Wastewater
UN	United Nations
USAID	US Agency for International Development
WB	The World Bank
WRSP	Water Sector Reform Program
WUA	Water Users Association
WW	Wastewater
WWTP	Wastewater Treatment Plant



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Introduction

Egypt is located partly on the African continent (desert and Nile Valley) and partly on the Asian continent (Sinai) and is separated by the Gulf of Suez and the Suez Canal in the Red Sea. Northern Egypt is bound by the Mediterranean Sea. The western part is bordered by the Libyan Desert (border with Libya), and the southern part by the Nubian Desert (border with the Sudan). The Egyptian borders in the Asian part of the country are with the Palestinian Territory of Gaza, Israël, and the Gulf of Aqaba between Egypt and Saudi Arabia. The total area of the country is 1 002 000km², 95% of it being desert. The **population** (around 84 000 000 inhabitants as in 2012) is **concentrated in the narrow Nile Valley and in the Delta of the Nile**. No mountains occur in the African part and the Sinai Peninsula culminates at mount Catherine (2641 m).

The **climate of Egypt is arid** with a rainfall average of 18 mm/y (10 mm/y in Aswan) and a total precipitation of 1,8billionm³/y. The water balance of water resources (including non-conventional water resources) and extraction is as follows:

- Nile River 55,5 billion m³/y
- Rainfall 1,3 billion m³/y
- Fossil Groundwater extraction 2,2billion m³/y
- Desalination 0,2 billion m³/y
- Renewable Groundwater extraction 6,2 billion m³/y
- Wastewater 2,9 billion m³/y Agricultural drainage water Reuse 13 billion m³/y

More than 70% of the total available water resource is originating from up-stream countries. The 1959 Nile water treaty between Egypt and the Sudan allocates 55,5 billion m³/y to Egypt and 18,5 billion m³/y to the Sudan. The treaty does not include allocation for the upstream riparians besides Sudan (Blue Nile and White Nile). Despite the Nile Basin Initiative where countries can cooperate, and after decades of discussions, until now, no consensus has been found between upstream countries and Egypt and Sudan. Another treaty was signed between upstream countries but without Egypt and Sudan. Since 2011, Egypt seems ready to have new discussions and try to find a common solution. As the Nile River represents most of its renewable resource for fresh water, Egypt remains very reactive about this question. Egypt, with less than 700 m³/y/capita, remains a country under conditions of water stress.

The **inhabitants** of around 84 000 000 are split into 43,5% of urban population (1/4 living in Cairo) and 56,5% of rural population. Egypt is Presidential Republic and a very centralized country without elected assembly except the Shoura's Assembly (consultation). The country is divided into 27 governorates. Each Governorate contains regions (Marakez – 166 in the country) including cities (divided into districts) and villages. Currently there are no locally elected assemblies. A new Constitution has been recently approved and is under implementation and a move towards decentralization is under discussion (election of people's councils for local administration).

The **distribution of the population is a big challenge** for water and waste water management, with an average of 79 hab/km² for the whole country, but with 1900 hab/km² for the Nile Valley and the Delta (4% of the surface of the Territory) and 44 000 hab/km² for Cairo.



The **Gross Domestic Product (GDP)** of Egypt in December 2011 was around 230 billion US\$ of which agriculture represents 15,5% (employing 32% of is the labor force), Industries 31,1% (employing 17% of is the labor force) and services 52,4% (employing 51% of the labor force).

Despite the increasing development of cities, **agriculture remains an important sector**. Less than 4% of the territory is arable of which 99,9% is irrigated, thus showing the important aspect of water resources management and wastewater treatment and reuse. About 3,7 million hectares are cultivated (excluding the new oasis agricultural development policy). The main crops in Egypt are Dates (1st place in the world), oranges (1st crop exportation) and other citrus, vegetable crops, cereals, rice, sugar cane, cotton and linen. Fishing is an important economic activity (with 2450 km of sea shores in the Mediterranean Sea and the Red Sea). About 86% of the water resources consumption is used in Agriculture (including drainage water and wastewater reuse).

Egypt **has some natural resources including phosphates, iron, manganese...** Egypt has also some **petroleum and gas reserves** (Delta, Mediterranean shore and Gulf of Suez). Hydropower represents 11.5% of the energy in the country (Aswan dam).

The industrial production includes agro-food, textile, chemical and building materials industries. All those industrial sectors generate wastewater which has an important impact on the water resources quality and the management of wastewater.

The third sector (trade and services) is well developed. Small businesses are numerous and employ an important part of the labor force.

Tourism is a very important sector for the Egyptian economy. In 2010, 14,8 million tourists visited Egypt, representing an income of 12,6 billion of US\$ (1st foreign currencies income of the country) and 11,5% of the GDP. The Arab Spring Revolutions had a serious negative impact on tourism and in 2011 less than 10 million people visited Egypt. During the first months of 2012, resumed touristic activities were registered. But the last events around the new Constitution have stopped this trend. Tourism activity needs safe and stable conditions in the country to reach the status of 2010. All the activities of the tourism sector have an important impact on water resources and wastewater management.

The use of water by sector is as follows: agriculture 86%, domestic 8%, industry 6%. Through pumping in drainage systems, the water can be reused several times. The current water stress in Egypt necessitates increasing water resources by **adding non-conventional water to the water balance equation** (including reuse of drainage water and wastewater) and developing a policy for water saving. **The potential volume of wastewater discharge** is around 6,2 BCM/y. Some wastewater reuse projects are currently being implemented.

Egypt is a Presidential Republic. After the "Arab Spring » revolution, the Constitution of 1971 was suspended in February 2011. A new Constitution has been approved by referendum on the 22nd of December 2012. Since 2011, a new organization for the Government was implemented with some new Ministries and new functions including water and wastewater management. A new Ministry for Drinking Water and Sanitation Utilities shows a strong political will of the new government to consider water a priority.

The President of the Republic is elected by universal suffrage. The Prime Minister is appointed by the President. A cabinet of 34 ministers forms the Government (only two women are Ministers at



present). Several Ministries are involved in water and wastewater management including resources management and protection, wastewater management, health protection and water use. **The main Ministries involved in water management are the following:**

- Ministry of Water Resources and Irrigation (MWRI).
- Ministry of State for Environmental Affairs (MSEA).
- Ministry of Water and Wastewater Utilities (MWWU).
- Ministry Of Health and Population (MOHP).
- Ministry of Finance.
- Ministry of Interior.
- Ministry of Agriculture and Lands Reform.
- Ministry of Local Development.
- Ministry of Industry.

Some other Ministries may be involved in water management, planning, investments or local development, as needed. **Egypt is highly centralized and water users are not involved in water management (with only a part involved through Water User Associations for irrigation),** but new reforms are underway for enhanced decentralization.

The **institutional framework** in Egypt is **relatively complete** with respect to laws, decrees and decisions in the water sector concerning water resources and protection, water use, wastewater management and water reuse. **However, important gaps still remain in the respective areas specifically in terms of participative management, decentralization and coordination between decision makers.** In addition to the Ministries mentioned above, **the following public agencies, organizations and companies are in charge of the implementation of the water policy for the management of water and wastewater:**

- EEAA (Egyptian Environmental Affairs Agency)
- EWRA (Egyptian Water and Wastewater Regulatory Agency)
- HCWW (Holding Company for Water and Wastewater) + 23 Affiliated Companies
- NOPWASD (National Organization for Potable Water and Sanitary Drainage)
- CAPW Construction Authority for Potable Water and Wastewater
- National Water Research Center

Egypt has **no general law on water management or a water code.** A **High Committee for Water,** under the steering of the Ministry of health, **involves the main Ministries and organizations dealing with water management.** This Committee gives guidance for monitoring strategies, standards, licenses, laws and decrees for drinking water, wastewater and mineral waters.



1. General overview of the status of development and implementation of wastewater strategies / action plans / policies

1.1 INSTITUTIONAL FRAMEWORK LAWS, DECREES, ORDINANCES, DECISIONS AND STANDARDS FOR WATER MANAGEMENT AND SANITATION.

As mentioned above, Egypt has no single general law on integrated water resource management; rather it has several sectorial laws and decrees in the three main sectors of i) Water resources (most of them on the Nile River waterways), ii) Environment and water protection and iii) Wastewater management and wastewater reuse.

The **main laws concerning the water resources and their protection** (including wastewater discharge) are:

- Law 27/1978 for the regulation of water resources and treatment of water.
- Law 48/1982 and Decree 8/1993 regarding the protection of the River Nile and waterways from pollution. This law is the main law for discharging in the river and waterways (concerns also the industrial liquid waste).

Specific laws for irrigation, law 12/1984 and law 213/1994, define the use and management of public and private sector irrigation and drainage systems.

Concerning the protection of the environment, including water resources, there is an environmental law 4/1994, amended by law 9/2009² that governs environmental protection in Egypt. The laws define environmental impact assessment (three categories A, B, C).

A recent law (law 3318/2009) **created the Supreme Council for Protection of River Nile and Waterways from Pollution**. Ministries with water management responsibilities participate in this Council.

On the regulations related to **the public private partnership**, a new law was issued in 2010 (No. 67/2010) regulating the Partnership with the Private Sector in Infrastructure Projects, Services and Public Utilities. The law also established the Public Private Partnership Central Unit at the Ministry of Finance (PPPCU).

- **Few laws concern directly the wastewater management** (except, for instance, law 93/1962 on discharge of all types of wastewater to sewerage networks, amended by decrees 649/1962, 9/1989 and 44/2000). However, numerous decrees regulate the wastewater sector
- Decree 169/1997 Egyptian Code for wastewater treatment works.

² The more recent laws of 1994 and 2009, include most of the previous texts including the Ministerial decree “380” in 1982 for the Protection of the environment against industrial pollution



- Decree 44/2000 related to the quality standard for industrial and commercial wastewater discharge into public sanitary sewers.
- Decree 134/1968 gives specifications of cesspits or septic tanks and evacuation procedures.
- Decree 135/1999 describes sanitation works for small communities and isolated buildings and necessary treatment stages.
- Decree 334/2002 Egyptian Code of practice (ECP) for sanitary works in buildings, specifications of sanitary works and wastewater disposal in isolated areas, specifications for septic tanks, cesspits and oil/grease traps.

Some other decrees are specifically oriented to **the reuse of wastewater**

- Decree 44/2000 initiates restricted irrigation for the safe use of wastewater on selected crops and distinguish the water quality requirements for unrestricted and restricted irrigation
- Decree 603/2002 prohibits the use of treated or untreated wastewater in irrigating traditional field crops (Reuse limited to the cultivation of timber and ornamental trees, taking into account measures to protect the health of agriculture workers).
- Decree 171/2005: The decree reviews the standards for the reuse of treated effluents and sludge in agriculture. The standards for reuse in agriculture are defined in the ECP 501/2005.
- Decree 1038/2009 prohibits use of wastewater, treated or untreated, for irrigating all food crops.

Some other **decrees concern the Agencies and organizations in charge of water and wastewater management or protection**

- Decree 2703/1966 Establishment of the Water Higher Committee in the Ministry of health.
- Decree 363/1979 setting the Cairo Wastewater Utility.
- Decree 133/1981 setting the Alexandria Wastewater Utility.
- Decree 135/2004 establishing HCWW and 14 subsidiary Companies.
- Decree 136/2004 establishing the EWRA for the regulation, follow up and monitoring of all water and wastewater activities.
- Decree 249/2006 transferring control over the assets of the water and wastewater facilities from local Administration Units to the HCWW.
- Decree 117/2010 Transferring control over the assets of the water and wastewater facilities from New Urban Communities Authorities to HCWW.

The references above relate specifically to the area of wastewater and sanitation. The areas of resource management (besides its protection) and its use as well as the sector of drinking water and of irrigation are little or not addressed.

All these regulations set the framework within which the management of water and sanitation sector is implemented. Revisions and other texts are under preparation. **The texts are quite numerous and generally well designed despite some redundancies and some shortcomings. Their effectiveness depends on their actual implementation on the ground.**



1.2 GOVERNANCE FOR WATER MANAGEMENT AND SANITATION.

The water management in Egypt is highly **centralized** and **largely sector-based**. The implementation of Integrated Management of Water Resources requires further impetus and the **means of coordination and dialogue between institutional actors are insufficient**. Many reforms have taken place in recent decades, the latest having emerged after the revolution of 2011. This is particularly the case with the creation of a new Ministry specifically in charge of drinking water and sanitation "Ministry of Water and Wastewater Utilities." **Four ministries play a key role in the management of water and sanitation** Ministry of Water Resources and Irrigation, Ministry of State for Environmental Affairs, Ministry of Water and Wastewater Utilities, Ministry of Health and Population.

1.2.1 **MINISTRY OF WATER RESOURCES AND IRRIGATION**

The Ministry of Water Resources and Irrigation (MWRI) is **responsible for all water resources Nile River, waterways, drains and groundwater. Any intake to use the resource** (surface and groundwater) is subject to a **license**. The Ministry **controls the quantity and the quality** of the resource through its own monitoring networks and laboratories. It has the **upper hand in irrigation infrastructure except for the last level, which is managed by the Water Users Associations (WUAs)**.

The Ministry participates in several **inter-ministerial committees for planning** (Planning Committee for the crops with the Ministry of Agriculture (annual planning), High Committee for Water, Wastewater Treatment Priorities Committee with MWWU, several committees for planning State policies and committees for the implementation of plans and programs). The Ministry relies on its representations in the governorates to implement its missions. It also has a tool for all areas of study and research; the National Water Research Center and its various institutes (12 institutes).

Also involved in the reuse of drainage water and reuse of wastewater, the Ministry of Water Resources and Irrigation is involved in almost all aspects of water management.

1.2.2 **MINISTRY OF STATE FOR ENVIRONMENTAL AFFAIRS (MSEA)/ EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (EEAA)**

MSEA is **responsible for policy formulation and preparation of plans for the protection of the environment, water quality monitoring and definition of natural protected areas**. EEAA (Egyptian Environmental Affairs Agency) is the executive tool of the Ministry. The EEAA has regional branches in charge of improving the Environmental Affairs in the Governorates.

The Ministry is responsible for policies related to the environment **including water quality (except groundwater resources which is the responsibility of MWRI)**. It manages a national network of 52 monitoring points including coastal areas and lakes (except the drainage system). It has an important role as **inspecting authority to enforce standards and can take legal action in case of infringement**. To achieve this mission the Ministry has a central laboratory and 12 laboratories in its regional branches and recently got mobile units.

The **data (not in computer labs) are then centralized in Cairo**. A national GIS database on the environment is being constructed. There **is no national database for water**.



The Ministry, through its various structures **controls impact studies**; this is obligatory for any new project. It provides guidelines and implements action plans to improve environmental impacts (e.g. industrial discharges). The Ministry has also an important role in **awareness raising and information of the public**. It has equally an important role in the overall policy of Egypt since it is **responsible for proposing the policy of the State in the areas of environmental protection, preservation of nature, promoting the quality of life and the implementation of sustainable development in general and sectorial policies of the State in cooperation with the relevant ministries and structures and ensuring its implementation.**

1.2.3 MINISTRY OF WATER AND WASTEWATER UTILITIES

The new Ministry of Water and Wastewater Utilities (MWWU) (Ministry of Water supply and Sanitation Facilities on the web site of the Egyptian Government) was **created in 2012 and took over its functions from the Ministry of Housing, Utilities and Urban Communities that had previously been in charge of the sector.** The Ministry **covers the whole sector of drinking water and wastewater.**

The Ministry's overall objective is **to provide sufficient drinking water of good quality to all the population and to treat the wastewater in such a way that the effluent discharge does not pose any health or environmental risks.** The role of the Ministry is to increase the capacity of water treatment, supply communities and industries with water, construct new wastewater treatment plants and improve the efficiency of the existing plants.

These **objectives are implemented through several organizations** under the supervision of MWWU and include the EWRA (Egyptian Water and Wastewater Regulatory Agency), HCWW (Holding Company for Water and Wastewater) and its 23 affiliated companies, NOPWASD (National Organization for Potable Water and Sanitary Drainage), CAPW (Construction Authority for Potable Water and Wastewater).

- **EWRA**

EWRA is **in charge of the economic and technical regulation of utilities and of supervising, reviewing and monitoring all water and wastewater activities.** EWRA controls the quality of the services provided by the water and wastewater companies through specific indicators. EWRA has no regional representation but a new law is currently being prepared with a more decentralized approach. EWRA has a centralized data base.

- **HCWW**

The **HCWW and the Affiliated Companies (AC) are under the status of the public sector companies.** **The mandates of the HCWW and AC are to purify, distill, transport, distribute and sell drinking water in addition to collect, treat and safely dispose of wastewater.**

HCWW monitors the ACs and provides them technical assistance and training. HCWW ensures maintenance, operation and rehabilitation of the infrastructure. Each AC works on the basis of five years Master Plans.



HCWW covers the Egyptian territory except the cities of the Suez Canal area where Drinking water is managed by companies and the wastewater by the Governorates (as of the date of preparing this report).

HCWW controls the quality of the drinking water and of the wastewater (auto-control) along the treatment process (including the networks) through its own laboratories (one in each AC with a total of 2 700 000 samples per year). **Data are centralized in HCWW using a GIS system.** The data are **not public and remain in the HCWW.** HCWW and each AC have an awareness Department for the provision of information to the population.

Several studies, programs and projects are funded by international funders EU, KfW, AfD, EIB, United States Agency for International Development (USAID), GIZ, WB...

- **NOPWASD, CAPW**

NOPWASD (**National Organization for Potable Water and Sanitary Drainage**) and CAPW (**Construction Authority for Potable Water and Wastewater**) are two organizations responsible for **investments of/in the overall water and wastewater sector.** CAPW is in charge of Greater Cairo and Alexandria and NOPWASD for the rest of the Egyptian territory other than that Suez Canal area.

1.2.4 **MINISTRY OF HEALTH AND POPULATION**

The Ministry of Health, through its Environmental Health Department, **establishes and enforces the drinking water standards, monitors and protects the quality of surface waters, inspects the wastewater treatment plants.**

The Higher Committee for Water (HCW) is under the responsibility of the Ministry of Health. The members of the Committee are MSEA, MWWU, MWRI, and Ministry of Defense, representatives of the Water Companies, EWRA, and National Center for Researches. **The Committee is responsible for the monitoring strategies for drinking water and wastewater, criteria for licenses (for drinking water and wastewater projects), water standards and preparation of laws.**

The Ministry of Health has **representations in the Governorates.** The Ministry **monitors the quality of drinking water** at the intake, after treatment and in the distribution networks (300 000 samples per year). **For wastewater monitoring,** the Ministry has a collection system upstream of the WWTP and at the point of treated effluent discharge of (only 800 samples per year).

The **data are collected on paper and centralized in Cairo.** A project for a national database is currently being prepared.

1.2.5 **MINISTRY OF AGRICULTURE AND LAND RECLAMATION**

The Ministry of Agriculture and Land Reclamation is **involved in improving agricultural activities and land reclamation, including water management at the farm level.** MWRI and Ministry of Agriculture work together in a common Committee for the yearly crops planning. The **challenge** for the Ministry of Agriculture is to increase agricultural lands and cropping **to respond to the demographic demand.** **Adequate management of water and wastewater in addition to reuse will therefore become increasingly important in the coming years.**



1.2.6 OTHER MINISTRIES

Some other Ministries are involved in water and wastewater management. **Concerning investments and subsidies to the water and wastewater Companies**, the Ministry of Finance, and the Ministry of Planning and International Cooperation play an important role. The **Ministry of Interior and Ministry of State for Local Development** are involved in local development and in rural areas. The **Ministry of Industry** is involved in industrial processes and discharge standards for industrial activities. All those Ministries have to work with the other main Ministries involved in water and wastewater management.

1.3 STRATEGIES, POLICIES AND ACTION PLANS FOR WATER AND WASTEWATER MANAGEMENT.

The management of water resources in Egypt remains highly **centralized with the major role being played by the Ministry of Water Resources and Irrigation**, although there are **three committees that are involved in planning the state policies**; (1) the higher water committee for the Nile Water, (2) the higher water committee for the follow up on the national water resources plan and (3) the higher water committee for the protection of the environment. The Government has shown willingness to manage the resource in an integrated manner but most of the programs and action plans are sectoral. A number of strategy documents and plans have been prepared with the support of international donors.

1.3.1 STRATEGIES

Sensu stricto speaking, **it cannot be claimed that Egypt is presently endowed with a National Water Strategy.** There is no contractual general text that is in force. However, many studies and approaches have been conducted or are underway to **propose a Water Strategy 2050**. Several papers have been written in recent years that are more prospective studies than strategy papers. These studies received financial support from many international donors and could be even initiated by them.

Only **two National Water Resources Plans have been applied in Egypt**. The second one, currently in place, has a **timeframe until 2017**. This National Plan is used as a **framework for the sectorial Plans and strategies on water resources, water supply, wastewater treatment and reuse, agricultural development, local development, protection of the resources etc...**

Concerning the national water strategy, the document for the **“2050 National Strategy for the Development and Management of Water Resources”** describes the **6 main political pillars of this strategy**:

- 1) Water resources development policies.
- 2) Rationalization of water uses.
- 3) Control the water resources pollution.
- 4) Completion and rehabilitation of the water resource system.
- 5) Adaptation with climatic changes.
- 6) Improve water management.



Only pillars **3, 4 and 6** have an impact on the wastewater management with the objectives of

- Reducing the pollution in the main drains.
- Expanding the use of water treatment units in the villages.
- Developing industrial wastewater treatment units.
- Preparing master plans at the governorate level.
- Improving IWRM mechanisms and the water legislation.
- Increasing the participation of the beneficiaries in water management.
- Improving the water media and awareness.

Wastewater reuse is presented in the Strategy as one of the possible solutions for increasing water resources. The rest of the strategy is more oriented on water resource management in terms of increasing the quantity and save water uses (agriculture).

In the framework of the National Water Plan, **HCWW has established a Master plan 2007-2037 or Strategic National Water Plan 2037 (National Strategy for water supply and sanitation).** Two thirds of the monetary value of this plan is dedicated to sanitation (20 billion Euros). It includes 23 Regional Master Plans. The Plan has to be implemented in two phases in medium term (2007-2012) and long term (2012-2037). The implementation is planned in five years interval with yearly Action Plans.

There is also the **Sustainable Agricultural and Development Strategy (2030)** that takes reuse of treated wastewater into account.

1.3.2 PROGRAMS AND ACTION PLANS

The Egyptian Government finances all the plans and programs through the State Budget. In the wastewater sector the HCWW and its ACs are not yet financially self-sufficient (e.g. through cost recovery) so the State continues to provide subsidies to the HCWW and the ACs. As for the investments, they are partially financed by the State while the rest is requested from external donors.

National Water Resources Plan 2017 (NWRP)

The NWRP describes how Egypt will safeguard its water resources in the future (till 2017 at this stage) with respect to both quantity and quality, and how it will use the resources in the best way from a socio-economic and environmental point of view. **Three pillars define the policy of the Plan**

- Measures to develop additional water resources.
- Better use of existing water resources.
- Protection of public health and environment.

On those pillars several programs were defined

- The Nile Protection Program.
- The National Drainage Program.
- The Great Dams rehabilitation Program.



None of the pillars or of the programs are specifically oriented to wastewater management. However, the protection of the water resources and public health and the development of additional resources have an impact on the sanitation policy.

Other Programs and Plans

Several other Programs, Plans and Projects are in progress or under preparation in the different Ministries with sectorial objectives.

A **Project for rural areas** is implemented by the Water Companies with a 2020 objective. This project is under the responsibility of the MWWU, but the project has been delayed.

A **National Water Safety Plan** is under preparation that is based on good water quality and sustainability of water supply.

Several projects are financed by international donors through specific cooperation programs

- Water Sector Reform Program (WSRP) –Phases 1 and 2 (2011 – 2015); funded by the EU and the Dutch Cooperation.
- Improved Water and Wastewater Services Program (IWSP) – Phases 1 and 2; covering Lower Egypt (2008-2014) and Upper Egypt (2011-2017); respectively, and funded by the KfW (leader), the EU, EIB and AFD.
- Institutional Strengthening to EWRA –Phase 3 (2011-2013); funded by the EU.
- Institutional strengthening to HCWW (2011-2013); funded by the EU.
- Water and Wastewater Management Program implemented by the GIZ on behalf of the German Ministry of Cooperation; BMZ.
- Integrated Sanitation and Sewerage Infrastructure Project (ISSIP) (ending 2015) funded by the World Bank.
- Project for Industrial Waste Treatment – funded by the KfW, and EIB.
- MED EUWI *National Policy on Water in Egypt* (2006-ongoing) that has thus far produced i) a Financing Strategy for the Water Supply and Sanitation Sector in Greater Cairo (including a Baseline Scenario), ii) a National Affordability Assessment to support the development of the Financing Strategy, iii) an Assessment on the Framework Conditions for Private Sector Participation in Water Infrastructure in Egypt and iv) assistance for the elaboration process of the Wastewater Strategy.

Some other donors have other projects in water and wastewater management USAID, JICA, and ADB, in addition to the Swiss, Italian, and Spanish development cooperation agencies. Apart from the investments projects, most of the donors' projects are oriented to institutional strengthening and capacity building.



2. Progress and achievements

The **institutional framework for the management of water and wastewater sector has undergone** in recent decades important **reforms** both at the regulatory level and in terms of water governance with the establishment of specialized management tools. **However**, many areas remained untreated or poorly supervised and are currently addressed, often with the help of international donors. It should be noted that **even if the laws or regulations exist, they are not all implemented or are partially implemented**, often for reasons of lack of availability of funds, causing delays in the implementation of various programs. Egypt has made a major effort in the field of water supply and urban sanitation. However, the **rural sector shows a significant delay especially in sanitation**. Similarly, the **industrial sector remains problematic and industrial waste water treatment policy is a major challenge for the coming years**. Despite the great efforts made by the State in terms of funding, they sometimes remain below the amounts needed to achieve the aspired objectives even with the very important intervention of international funds. The state of the databases, their design and management is underdeveloped and uncoordinated. This aspect should be taken into account in planning ahead.

The table below gives an overview of the water sector and sanitation in Egypt at the moment

	EGYPT
INSTITUTIONAL FRAMEWORK	
Ministries/organisations in charge of Water Management	<ul style="list-style-type: none"> • Ministry of Irrigation and Water Resources. • Ministry of State for Environmental Affairs. • Ministry of Water and Wastewater Utilities. • Ministry of State for Local Development. • Ministry of Health and Population. • Ministry of Finance.
in Agriculture	<ul style="list-style-type: none"> • Ministry of Agriculture and Land Reclamation. • Ministry of irrigation and Water Resources.
for Drinking Water	<ul style="list-style-type: none"> • Ministry of Water and Wastewater Utilities. • Ministry of State for Local Development. • Ministry of Health and Population. • HCWW, NOPWASD, CAPW, EWRA, Governorates.
for Sanitation	<ul style="list-style-type: none"> • Ministry of Water and Wastewater Utilities. • Ministry of Irrigation and Water Resources. • Ministry of State for Environmental Affairs. • Ministry of Agriculture and Land Reclamation. • Ministry of State for Local Development.



	<ul style="list-style-type: none"> • HCWW, NOPWASD, CAPW, EWRA, Governorates.
Environment	Ministry of State for Environmental Affairs. EEAA
Water Police	
Water Intakes	MWRI, MOHP
Water Discharge	EWRA, MWRI, MOHP
Quality	EWRA, NWRC, EEAA
Health	Ministry of Health and Population
Law on Water and Environment	
Under application	law 93/1962, law 48/1982, law 4/1994, law 9/2009
Under preparation	new law to be adopted
Sanitation laws and regulations	
Urban sector	Law 93/1962, decree 135/2004, law 38/1967, decree 135/1999, decree 286/1990, decree 168/1997, decree 169/1997, decree 334/2002, law 117/1961, decree 363/1979, decree 133/1981, Law 203/1991, decree 249/2006, decree 117/2010, decree 136/2004,
Industrial sector	Law 93/1962, Law 48/1982, decree 649/1962, decree 9/1989, decree 8/1993, decree 44/2000
Agricultural sector	Law 213/1994, law 12/1984,
Runoff	
Laws and regulation for wastewater reuse	law 93/1962, Law 44/2000, decree 603/2002, decree 171/2005, decree 1038/2009, ECP 501/2005
Organizations in charge of sanitation	
Public and national	HCWW, NOPWASD, CAPW, EWRA
Public and decentralized	23 Affiliated Companies in the Governorates, CAPW, NOPWASD.
public and local	None
private	None
Wastewater reuse	
Texts	law 93/1962, decree 44/2000, decree 603/2002, decree 171/2005, decree 1038/2009, ECP 501/2005



Organizations in charge of drinking water	
Public and national	EWRA, HCWW.
public and decentralized	Water Companies, NOWASD, CAPW
public and local	None
private	
texts	
Public/private Partnership	Only one BOT, new BOT under preparation. New law issued in 2010 (67/2010)
Status of decentralization	Limited decentralization but new law is under preparation
Cooperation Structures, coordination and consultation between organizations	High Committee for Water and several inter-ministerial committees
Planning structures	Higher Committee for Water, Higher Water Committee for the Nile Water, the higher water committee for the protection of the environment, Ministries
Strategies, Policies and Action Plans	
National Strategy for Water Management	MWRI, NEAP 2002/2017, NWRP 2017, Strategy 2050
Modality and design	HCWW, NOPWASD, Ministries
Modality for implementation	Plans
National Strategy for Sanitation	National Plan for Egypt 2007/2017
Modality and design	HCWW
Modality for implementation	Water Companies
Policies for Sanitation	Five Year Plan for wastewater Projects, AC Master Plans for Water supply and Sanitation services 2037, Development Policies Water and Wastewater Sector in Egypt
Modality and design	HCWW, AC Master Plans
Specific policies for agriculture	Strategy for Agriculture Development
Action Plans for Sanitation	
National	HCWW yearly action plans
Regional	GEAP, AC action plans
Local	



Involvement of Stakeholders and Water Users in Strategies and Policies design	No participation
Who?	
How?	
At what level?	
Concertation	
Planning	
Role of women	The role of women in water management is low.
Policies for Urbanization	
Policies for rural development	Ministry of Local Development
Policies for Wastewater Reuse	No national plan. But wastewater reuse is part of the new 2050 strategy. Institutional framework has to be adapted.
Status of IWRM implementation including information and involvement of Water Users	Although IWRM is displayed as a basis for planning by the government, its development is limited, especially in relation to the participation of water users.
ACTION PLANS	
Commitment at National level	HCWW five years master plans and yearly action plans
Commitment at regional level	AC five years master plans and yearly action plans
Commitment at local level	None
Institutional Means	HCWW, AC, EWRA
Human means	Employees of the agencies and AC
Financial means	State budget and loans, partial cost recovery
International programs and projects for water and sanitation management	EU, WB, KfW, AfD, JICA, GIZ, USAID, NL, EIB, ADB
Completed	WSRP 1, Institutional Strengthening 1 and 2.
in progress	WSRP, IWSP, Institutional Strengthening to EWRA and HCWW, World Bank Program ISSIP, GIZ Water and Wastewater Management Program...
STATISTIC and DATA BASES	
Population	81 931 242 (2012)
Water consumption	



Total country	Demand 77 BCM/Y
Urban	8%
irrigation	86%
industry	6%
Per capita	670 m ³ /capita
Volume of wastewater discharged	
Urban	6,2 BCM/y (2,4 BCM/y treated)
rural sector	12,2 BCM of agricultural WW in drainage systems
Industries	1,9 BCM of industrial WW
Connection rates of population	
Urban drinking water	100%
Rural drinking water	98%
Urban sanitation	>95% including small towns
Rural sanitation	Only 12% of WW treated in villages
Number of urban WWTP	372
Number of industrial WWTP	no statistics
Rural sanitation	75% septic tanks and latrines
Level of treatment of wastewaters	60% primary treatment, 40% secondary treatment no tertiary treatment
Volume of treated wastewater reused	13BCM of drainage water are reused in irrigation. 0,7 BCM/y of TWW is reused.
WWTP sludge	
DATA	
Existence and location of the data bases	
National	Ministries and National Organisations
Decentralized	Water Companies, Regional Health Delegations
Local	no data bases
Data base for the quantity	
Environmental	MWRI
drinking water	EWRA, Water Companies



wastewater	EWRA, Water Companies
Data bases for the quality	
environmental	EWRA, MSEA
drinking water	EWRA, Water Companies, Ministry of Health
wastewater	EWRA, Water Companies, Ministry of health
Accessibility of the data bases	
Between organizations	On request
water users	No accessibility
Are all data bases centralized?	No
Type and condition of networks measurements and monitoring	
Environment	National network and monitoring for environmental quality. Network of MWRI for monitoring water resources quality.
Water quality	Network of the Ministry of Health
Discharges	Network of Ministry of Health
Monitoring programs	No coordination between networks and monitoring of the several agencies.



3. Challenges, constraints and gaps

The Government of Egypt has decided to manage water according to the principles of Integrated Water Resources Management including a demand management approach. Some aspects of the sanitation sector development that are currently implemented, present certain gaps or are insufficiently developed. Institutional, planning and technical frameworks can be improved even if strategies and policies of the Government, already existing studies and financial means (from State and donors) are well engaged and seem to have a priority.

3.1 THE RURAL SECTOR

During the last decades, **important efforts** have been made by the Government **for sanitation in urban areas** and most of the wastewater of the towns is collected and treated (even if the efficiency of the WWTP is not up to standard due to the lack of maintenance and rehabilitation). On the other hand, the **rural sector is lagging behind**; with only 40% of the villages having secondary wastewater treatment. A program for improving sanitation was decided (2000 – 2020) for the rural sector. The program, which falls under the responsibility of the MWWU and must be implemented by the Water Companies, is also running with delays. All the **related Ministries** (MWRI, MSEA, MOHP) **emphasize the pollution risk generated by the wastewater in rural areas** (56% of the population is rural) **and the impact on water bodies, but there is no clear institutional framework which defines who is in charge of what for the sector**. In addition **no operational decentralization structure exists**. A great disparity is present between the urban sector and the rural sector in terms of wastewater management, which is important to improve. **The rural area wastewater management, which includes small towns, villages and scattered settlements, has to be developed with clear institutional, technical and financial frameworks.**

A wastewater strategy for rural areas should be developed to include the following points

- Definition of a new institutional framework at the administrative level and clarification of who has responsibility in this area and what responsibility. Options for the institutional framework that should be put in place to extend rural sanitation coverage include the possibility of establishing a national body under the responsibility of the Ministry of Water and Wastewater Utilities to be completely in charge of the rural sanitation portfolio including all its financial and institutional requirements. Another option is to decentralize through the establishment -within each water and wastewater company- of a dedicated sector for the sanitation projects (but there is currently a lack of technical knowledge in the companies for this option).
- In the case of villages, small towns and grouped housing, it is important to **define the community size for which it becomes relevant and effective to design collection systems and centralized treatment**.
- Provide appropriate **technologies that are economical** in terms of investment and maintenance, **rustic** (not requiring high technical expertise), **effective** and **easy to operate and maintain**. There is, in this case, a strong need to invest in scientific research to find



alternative low treatment cost solutions that can suit the varying conditions within the country.

- **Provision for semi-collective sanitation solutions**; to limit the construction and maintenance of networks that are disproportionate to the number of users collected.
- Provision of **technical solutions for scattered settlements**, standardizing and disseminating techniques of sanitation systems. This involves the development and dissemination of practical guides to users and construction contractors.
- Provisions for **Information, training and participation of stakeholders and users** as key requirements for successful rural sanitation policy.
- Provisions for **management of sludge after treatment as well as treated wastewater discharge** (including the reuse of wastewater and sludge within local reuse plans; for example in the plantation of industrial oil crops for the generation of biofuel).

All these aspects should be set up within a regulatory and institutional framework and subject to appropriate controls (adapted and updated institutional framework including standards).

In order not to further squander this valuable source, the delay in the rural sanitation sector should be recovered and appropriate financial means and incentives that allow reducing the existing imbalance between rural and urban areas should be established.

3.2 WASTEWATER REUSE

Reuse of treated wastewater is presented by the Government as a necessity and is considered as part of the unconventional resource that is taken into account in the forecasted balance between supply and demand of water resources in the country. Currently a number of activities and projects are underway. However, **reuse of treated wastewater requires a clear framework and a number of well-established rules and technologies in order to limit the risks related to the exploitation of this resource**

- The **status** of this resource must be **precisely defined** as well as the **roles** of the involved institutions/bodies. The current institutional framework does not clearly answer these questions. The responsible organisation for the utilization of this resource must be identified as well as the conditions of implementation of the projects.
- The different **types of reuse and the respective quality should be established** through realistic standards while integrating the results of experiences and knowledge gained in the various pilot cases and in other Mediterranean countries.
- The technical and administrative constraints for the health protection of users, riparian (in the case of irrigation) and consumers of the crops produced by irrigation with treated wastewater have to be defined and taken into account for each project.
- **Rules for TWW reuse project design have to be fixed** (including the additional treatment required depending on the use, networks investments and maintenance, irrigation constraints, management governance, sanitary constraints and cultivation planning). In addition, control processes and monitoring have to be included.



- **Financial means have to be clarified for investment** (networks from WWTP to irrigation area, complementary treatment, storage, maintenance, energy and operation).
- It is necessary to define who is in charge of the project and how the project is implemented (perhaps through Water User Association for example). Water users have to be involved in the project design, implementation and management.
- For a good design, management and implementation of WW reuse projects **technical capacity building has to be provided at all levels**.

However, the **current framework, both institutionally and technically is inadequate or unsuitable** (e.g. **reuse standards** in agriculture are very **restrictive and should be modified** based on the experiences acquired in many of other countries, including the Mediterranean countries. The ECP 501/2005, currently being modified for the types of crops that can be used with the different treatment levels; should take that into consideration).

The **establishment of a training/capacity building policy is needed** at all levels from design to implementation and management of projects. Also a policy on information, consultation and involvement of users should be developed and implemented.

The current situation of the **treated wastewater quality poses a problem for the development of WW reuse**. Firstly, only 40% of TWW undergoes secondary treatment (the rest is in primary treatment), which limits significantly the possibilities for irrigation. The **reliability of the quality of TWW is not guaranteed**, which is a major hindrance for reuse in agriculture. This problem can be attributed to various reasons, for example to the poor design and/or poor maintenance of the wastewater treatment plants, the discharge of untreated industrial discharges to the sewer system, and the significant fluctuations in inflows and salinity. **Securing a proper operation of the station is therefore required (sustainable management of wastewater)**. In order to create a growing demand, **it is necessary that trust is established between the provider and the user**. Contracts between the different actors in the chain (supplier of TWW, distributor and users) are imperative.

It is obvious that the **water users, regardless of their use (agriculture, industry, domestic), do not pay sufficiently for water to cover the actual cost of investments, provision of the treated wastewater, operation, maintenance, resource protection, but only part of the service** which depends more or less on the use type and policy decisions), the rest of the cost is financed by the national community as a whole through various taxes.

It is **necessary**, in view of the political will to develop the reuse of TWW, **to elaborate a National Plan of Wastewater Reuse taking into account the elements described above**. In this context, a major **challenge** would be to **introduce public private partnership** to enable the involvement of the private sector in the construction, the operation and maintenance (O&M) of treatment plants and reuse in high value plantations and exports; as indicated by a recent study implemented by USAID.

3.3 WWTP SLUDGE MANAGEMENT

Sludge from WWTP is a significant problem. Reuse of sewage sludge is under a Decree with very **restrictive standards**. This can be justified in part by the potential presence of toxic elements related to the presence of industrial effluents in the wastewater and partially by the health risk linked with



insufficient treatment of the WWTP. In this **sector institutional and technical strengthening has to be implemented. It is possible in each governorate to develop plans for WWTP sludge management. Technical recommendations can then be made available to designers and operators of WWTP as well as to potential users including industries.**

In the case of sludge reuse, the role of the manager and users and their interaction, fields of activity and responsibilities must be clearly defined.

3.4 INDUSTRIAL WASTEWATER

Industrial WW, whether discharged to the environment or to the sewers collection networks, **represents a risk of environmental pollution and a handicap for WWTPs** that are generally not able to process some pollutants and may therefore see their functioning disturbed (with a significant impact on the TWW reuse or on sludge which may have significant toxicity making their reuse difficult). The **problems** in industrial wastewater are **particularly related to the small and medium industries**, which discharge into water ways and sewerage networks. In order to meet the EU regulations for export, the large industries are eco-certified and are using closed-loop system involving treatment and recovery of treated wastewater that promote the conservation of water).

Only general institutional framework exists for industrial wastewater discharge (specifically in the drainage system). **A more precise framework has to be established with a sector approach for each type of industrial processes.**

No efficient financial incentive programs are in place for the **depollution** of industrial discharge. Moreover, the polluter / payer principle registered in the law is not applied due to limited inspection, monitoring and enforcement capacities.

A policy promoting clusters of industries that are within the same sector of activity, and a proactive policy vis-à-vis the pretreatment of industrial effluents before discharging into the urban network should be implemented.

This **industrial sanitation sector should be developed with stronger constraints. Informative and educational approach with industrialists** is necessary for awareness and efficiency. A strategy for industrial discharges should include the following

- Improvement of industrial processes to **save water** (and therefore discharge).
- Encouragement to **use the recycling of wastewater within the plant.**
- Specific **pretreatment of the effluent before discharging into an urban collection network** or into the natural environment.
- **Grouping plants in industrial areas** to provide a specialized WW treatment that is catered to the sector-specific activity.
- Develop a **communication and information strategy** for the industries and provide training.
- Oblige the manufacturers to **self-control their discharges in terms of quantity and quality** and to communicate results to EEAA and managers of WWTP if their industries discharge into an urban network.



Some of these points are already partially implemented but this policy should be supplemented and strengthened. **An equally important challenge is the quality of agricultural drainage** (high in ammonia, etc.). **Treatment of agricultural drainage** prior to discharge into water ways should be contemplated.

3.5 MWWU, EWRA, HCWW, NOPWSAD, CAPW GOVERNANCE

The water and sanitation sector in Egypt has been the subject in recent decades of many developments to reach the current schema. The **last important change** occurred after the "Arab Spring" by **creating a specialized ministry, "the Ministry of Water and Wastewater Utilities", presently in charge of the entire sector** (which was previously supervised by the Ministry of Housing). The **Ministry relies on several agencies** and organizations under its supervision (EWRA, NOPWSAD, CAPW). It has also **control over the activities of the HCWW and its ACs**.

Regarding wastewater, it is clear that the **HCWW and ACs are in charge of the operation and maintenance of networks and WWTPs**, while **planning and investment in infrastructure pose additional complexities as they involve a wider range of actors** (i.e. Ministries). **The geographical distribution of competences for investments between CAPW in the two major Megacities (Greater Cairo and Alexandria) and NOPWSAD in the rest of the territory can pose a number of problems in relation to the activities of the HCWW, particularly in terms of priorities for planning.** This can lead to overlapping jurisdictions between agencies if a perfect coordination is not assured (which is always difficult for organizations that are independent from each other). The current situation, with a strong centralised structure, certainly limits the risk, but the introduction of decentralization (definition of the roles and responsibilities of governorates and local communities will be necessary for the water sector), which is desirable and seems to be in the current general policy objectives, should be accompanied by an overhaul of the current system. That will also offer an opportunity to redefine the place of WW management of rural areas.

3.6 PARTICIPATION OF STAKEHOLDERS AND USERS

There are quite a **few non-governmental organisations (NGOs) in Egypt, but they do not participate in the management of sanitation**. Their interventions are largely restricted to projects submitted to the Ministry of Environment regarding environmental impact studies. They also participate in the management of solid waste. **Except for WUAs for irrigation, users are not actually involved in the management of water and sanitation**. Although the Government has shown willingness to manage water according to the IWRM principles, that include participative management and the principle of subsidiarity, the latter is not implemented in Egypt. The sanitation sector seems particularly devoid of participative structures. However **modern management of water highlights the need for participative approach and a "bottom up" management**.

Relationship with users is limited mainly to a collection of grievances (HCWW) or information campaigns (EEAA). This, however is not sufficient. It is also necessary to promote information and awareness training for users. Planning and implementation of programs and plans of action have to be made seamless. **Egypt, in the water sector and more particularly in the wastewater sector, must improve its participatory approaches and create more space for dialogue between institutions and users.** However the situation after the revolution requires that participation is embedded in all



aspects of water and wastewater development - from the initiation of plans all the way to implementation. This is referred to as upstream approach versus downstream approach. In any case, the participatory approach requires integrated policy involving information and awareness raising and training of stakeholders at the downstream and upstream end of development.

It is often that funding agencies, in their intervention programs, highlight the need for users' participation and the establishment/facilitation of dialogue.

3.7 PRICING AND COST RECOVERY

Companies in charge of drinking water and sanitation (HCWW and ACs) are not mandated to set the tariff structure for the services they provide. It is the **State which approves** rates according to socioeconomic and political criteria. This results in **low prices** that do not cover the cost of the service or the operation of these organizations in the majority of cases (only one company balances its budget). **This situation causes significant dependence of the companies on the State (for subsidies)** and often with financial difficulties related to insufficient contribution of the State. Furthermore, the **situation is aggravated by low collection rates** (this phenomenon has worsened after the "Arab Spring") or even the **lack of efficient billing systems**.

Although very crucial for the sector's sustainability, the pricing for drinking water and sanitation is still a sensitive issue in countries where centralized management is strong. However, it stems from practice and accompanying economic analyses that at least the user pays for the service (provision of drinking water, water for industrial processes or to produce crops in agriculture and wastewater treatment necessary for the protection of the resource). The majority of investments are supported by the State and international donors. It seems appropriate to expect **that covering the cost of provision of the resource is applied. This needs to be implemented also in view of social equity considerations, including an equalization system between consumers and respecting the principle that "every human being has the right to access safe drinking water and sanitation."**

The **non-application of the polluter - pays principle aggravates the situation** especially in relation to the discharge and treatment of industrial wastewater.

The current **tariffs** are clearly **insufficient to allow normal operation of the companies** in charge of water and sanitation in Egypt. They should be adjusted gradually and in accordance with the socio-economic situation of users, with due consideration to pro-poor policies. These tariffs should be regularly revised based on the general economic condition and related developments.

3.8 PARTICIPATION OF THE PRIVATE SECTOR

Although private sector participation is encouraged by the Egyptian Government, few operations have been implemented in the sanitation sector. **Only one BOT is underway although several projects exist and more are in the pipeline.**

Opportunities for the private sector interests are however significant in the wastewater sector and could be related to the management of networks and WWTP, sludge management, reuse of wastewater etc



Policy in this direction should be further developed as long as the institutional framework is clear and precise for the technical implementation and the financial aspects. Generally the private sector is prudent to get involved if safeguards are not duly provided. Moreover, mutual understanding of the opportunities and challenges (including roles, responsibilities, risk assessment, etc) involved in public-private partnerships need to be in place on both sides of the equation, as verified by the MED EUWI psp-related work.

3.9 DATA BASES AND MONITORING NETWORKS

In Egypt there is **no national water data base** (resources, drinking water, wastewater, irrigation, environment, etc.). Each Ministry involved in water management, each National Agency, each company has its own measuring stations network, its own sampling programs, its own database and its own management criteria without real consultation between operators.

The tools used for the databases vary from data on paper to the use of GIS. The result is a significant **challenge for providing an overview of the situation.** An **effort should be made** by the various ministries, agencies and companies **to update their databases and improve the management of these databases.** Coordination has to be created between the data managers to structure effective monitoring networks and data acquisition, to maximize information and avoid duplication and thereby optimize costs.

At the moment the multiplication of the databases, the differences in format and geographical distribution does not allow easy communication of data between organizations. Some of these data are only accessible within the organization itself and are not public.

3.10 REMARKS ON WATER AND SANITATION MANAGEMENT IN EGYPT

The state clearly displays a willingness to manage water resources based on the IWRM framework and principles. But the current organization of the sector does not seem to facilitate such an implementation. The water management in Egypt is highly centralized and participative management is largely absent in the current schema. The national policy is strongly focused on water resources' exploitation and protection through heavy investment in urban sanitation and drinking water supply. This is a real success in terms of accessibility to drinking water for almost all of the population but more mitigated regarding sanitation (treatment level and effectiveness of WWTP, lack of capacity building), especially in rural areas, which is still lagging behind. Accordingly, the current sector policy is mostly supply oriented since users and stakeholders are not involved in the process.

The relatively tight separation between the management of the resources (MWRI) focusing on the quantity, and the protection of this resource (MSEA) focusing on the quality while having the responsibility of MWWU for drinking water and sanitation, do not facilitate the integrated management of water resources. On the other hand, the grouping of drinking water supply and sanitation management within a single entity is an asset.

This current situation results in a multiplicity of strategies, programs, plans, which often could be grouped under the same larger thematic. This highly sectoral and vertical planning goes against the IWRM principle which aims essentially at horizontal and vertical integration of all components in addition to technical know-how (social among others). Sometimes laws and decrees exist but are not



well applied or not applied at all. In some sectors, the situation could be improved only by updating some laws, decrees, guidelines or standards.



4. Opportunities

Although the situation is not yet stabilized, the current political context following the "Arab Spring" supports the commitment for significant reforms. Ongoing changes could focus on issues that would permit fundamental reforms that seem necessary for the future of the environment and protection of natural resources, such as decentralization, participation of stakeholders in decisions, and transparency/accountability. The current revision of the institutional framework for the management of water and sanitation (revision of the current law), adjustments to ongoing plans and programs and the preparation of new ones in areas previously forsaken, are significant opportunities for which support should be provided.

The initiative launched by the President to involve NGOs in the conceptualization of development in Egypt (including water resources), the new paragraph on water in the new Constitution, the preparation of a Rural Sanitation Strategy and the new Water Law³, in addition to the program for the licensing and certification of WWTPs for Technical Sustainable Management, are very important opportunities to develop a more integrated water management policy.

³A new Water Law has been prepared and is expected to be submitted for approval to the people's council



5. Proposed Actions and recommendations

Based on the request of the country during the National Consultation Workshop, a more action oriented set of recommendation is listed below:

- The **institutional framework of the WW reuse must be updated and completed.** Strengthening of technical expertise and training of staff in charge of its implementation and its management should be undertaken. Information should be disseminated to the public, whilst training and user participation should be developed. Sustainability of the quality of TWW should be sought through increasing the level of treatment and securing the good functioning of the WWTP. In addition, a strong policy on industrial discharges has to be established.

Recommendations for actions

- Revise, update and complete the wastewater institutional framework laws and Decrees, Norms and Standards (considering existing experiences in Egypt and in other Mediterranean countries for the various types of reuse).
 - Define which institution is in charge of the wastewater reuse policy.
 - Design a National Wastewater Reuse Plan.
 - Promote capacity building for strengthening of technical expertise in the bodies in charge of design, implementation, operation and maintenance of treated wastewater reuse projects.
 - Develop awareness, information and training plans for users (including related health recommendations).
 - Develop programs for improving the WWTP efficiency in the companies in charge of the operation and maintenance of the WWTP.
 - Define new quality constraints for wastewater discharge in urban sewerage networks and control policy.
 - Define the required treatment level related to the reuse objectives and plantation types.
 - Define Action Plans to increase the level of treatment in the WWTP as necessary.
 - Define how users can participate in the projects from design to implementation.
- The **rural sanitation sector presents a large deficit in strategies** (although actions have been initiated) and in the technical and institutional framework. Strengthening of this sector is a priority and certainly requires further studies for their definition (e.g. set thresholds on the size of groups of habitats where collective sanitation is to be avoided). Users' training and information are priorities.



Recommendations for Actions

- Revise, update and complete the institutional framework for rural sanitation (define who is in charge of the sector, who designs, implements and operates, and who controls).
- Initiate studies (technical and economic) to define where collective sanitation is to be avoided, where semi collective sanitation is recommended and where autonomous sanitation has to be implemented.
- Initiate local Sanitation Plans.
- Develop awareness, information and training plans for users.
- Define how users can participate in the projects from design to implementation of collective or semi collective projects.

As part of the Rural Sanitation development, suitable and inexpensive technical solutions for autonomous or collective sanitation should be strengthened (it will be necessary to avoid standardized answers that might not meet the environmental, societal and economic context). The information and the provision of practical guides, including autonomous sanitation, should be implemented.

Recommendations for Actions

- Initiate studies of existing technical solutions suitable and inexpensive for autonomous or collective sanitation existing in other countries of the Mediterranean countries to select which can be applied in Egypt.
 - Prepare Guide lines for constructors and users describing the several technical solutions and how to operate and maintain.
 - Organize capacity building for constructors, operators and users (that can be a part of the Local Sanitation Plan).
- Industrial wastewater discharge represents a significant impact on the efficiency of WWTP and on the possibility of reuse of TWW and sludge. A more precise institutional framework has to be established with a sector approach for each type of industrial process. Efficient incentive programs have to be proposed for depollution and the polluter / payer principle has to be implemented. A policy promoting industry clusters in the same sector of activity and a proactive policy vis-à-vis the pretreatment of industrial effluents before discharging into the urban sewerage network should be implemented.

Recommendations for Actions

- Information campaigns intended for industrials to improve processes to save water and encourage the use of recycling of treated wastewater within the plant.
- Elaborate guide lines for specific pretreatment of the effluent before discharging into collection networks or into the natural environment.
- Elaborate institutional framework to impose rules for discharging and to strengthen controls.



- Plan to group plants in new industrial areas to provide a specialized Wastewater treatment specific to the sector activity.
 - Organize and develop a communication and information strategy for industrial training.
 - Force the manufacturers to self-control their discharges in terms of quality and quantity and to communicate results to EEAA and managers of WWTP if they discharge in an urban network.
- An effort is needed by all databases managers to improve compatibility between the databases and in the long term to have the possibility of developing a national database for water. Transparency between the data bases is a necessity. Coordination between all the stakeholders (Ministries, Agencies, Companies), including measurement networks and analytical monitoring, is an important challenge.

Recommendations for Actions

- Create a National Water Data Base Committee with representatives of all stakeholders involved in water management (Ministries, Agencies, Companies, etc.).
 - Identify information requirements to enable more informed decision making and define the data needed from the different stakeholders to meet those requirements. Establish data flow procedures and data exchange mechanisms (in the format needed). Another option is to initiate studies to make the several data bases compatible.
 - Initiate a National Water Data Base (environment, quantity and quality of resources, irrigation, drainage, drinking water, wastewater, meteorology, hydrology, hydrogeology, etc...) that can be used by decision makers.
 - Coordinate all the monitoring networks (could be done by the National Water Data Bases Committee).
- **Information extension, education and training programs and broad participation of users and the public must be implemented.** This area is currently undeveloped especially upstream of the definition of strategies, policies, plans, programs and actions to be involved.

Recommendations for Actions

- Define how the public and users can be involved in the definition of strategies, policies, plans, programs and action plans and how they can be involved in projects from design to implementation in the water/wastewater sector.
- Elaborate information, education and training programs for the stakeholders and the users in the related sectors (environment, sanitation, drinking water, irrigation, etc...).
- Create spaces for dialogue between institutions and users at all levels (local, regional, national).



- An effort should be focused on the prices charged for water and sanitation to enable companies to achieve financial independence. This approach would certainly boost the private sector participation in these activities. Socio-economic studies should be however undertaken to reflect realities on the ground and to be realistic in the proposals. Progressive tariffs is an option with due consideration to affordability by the poor.

Recommendations for Actions

- Initiate economic studies on wastewater treatment cost recovery and socio-economical capacity of users to evaluate how the consumer can be charged and to define a new cost recovery policy with an agenda for realistic price increase.
 - Increase the rate of bill collection by the Companies by information campaigns of the consumers.
- It seems important to define and implement a policy for management and valorization of WWTP sludge including an updated institutional framework.

Recommendations for Actions

- Revise, update and complete the institutional framework of the WWTP sludge management.
- Define for each WWTP a sludge treatment and management Plan.
- Elaborate sludge treatment, management and reuse plans for WWTP sludge at all levels (National Plan, Regional Plans and Local Plans).
- Revise, update and complete norms and standards for sludge reuse considering existing experiences in the Mediterranean countries.

A reform of the administrative framework (capacity building, governance) of the water sector seems essential in order to implement the principles of demand management and IWRM, displayed by the government.



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7. Annex: Report on National Consultation

**REPORT FROM THE
NATIONAL CONSULTATION WORKSHOP ON
THE STATUS OF IMPLEMENTATION OF WASTEWATER
STRATEGIES AND/OR ACTION PLANS IN EGYPT**

Intercontinental City Stars Hotel, Cairo, Egypt

11 March, 2013



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List of Abbreviations & Acronyms

CAPW	Construction Authority for Potable Water and Wastewater
CEDARE	Centre for Environment and Development for the Arab Region and Europe
EWRA	Egyptian Water and Wastewater Regulatory Agency
GIZ	Gesellschaft für Internationale Zusammenarbeit
HCWW	Holding Company for Water and Wastewater
IWRM	Integrated Water Resources Management
MWRI	Ministry of Water Resources & Irrigation
MWWU	Ministry of Water and Wastewater Utilities
NGO	Non-governmental Organisation
NOPWASD	National Organization for Potable Water and Sanitary Drainage
O&M	Operation and Maintenance
PCs	Partner Countries
SWIM-SM	Sustainable Water Integrated Management-Support Mechanism (Project funded by the EC)
TSM	Technical Sustainable Management
USAID	United States Agency for International Development



1. Workshop Background, Objectives

1.1 Introduction

The Sustainable Water Integrated Management – Support Mechanism (SWIM-SM) is a regional technical support project funded by the European Commission (EC) and that includes the following Partners Countries (PCs): Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria⁴ and Tunisia. The project aims to promote actively the extensive dissemination of sustainable water management policies and practices in the region given the context of increasing water scarcity, combined pressure on water resources from a wide range of users and desertification processes, in connection with climate change.

Within its scope of work, SWIM-SM is implementing a set of activities to support more effective water governance, mainstreaming and resource management, which included during the first year of implementation a review and analysis of the status of development and implementation of wastewater strategies and/or action plans. Within this context, a 1-day national consultation workshop took place in the Intercontinental City Stars Hotel in Cairo on 11 March 2013 and brought together 30⁵ relevant high level officials and policy makers, representing the water and wastewater and environment sectors in Egypt (including the water and wastewater companies) and stakeholders from relevant ministries of Health and Finance. Furthermore, representatives from the water/wastewater programmes, nongovernment organisations as well as donors and eminent experts with relevant experiences in the region participated in the workshop. The detailed list of participants is included in Section 8.

1.2 Objectives and expected results

As part of its work plan of 2012, SWIM-SM conducted a Regional Review of the status of the development and implementation of Wastewater (WW) strategies/policies and/or Action Plans in three SWIM-SM project countries including Egypt. The review (a) illustrated the status of development and implementation of wastewater strategies, plan of actions and associated policies; (b) identified related achievements; (c) examined constraints and challenges; and (d) identified opportunities for advancing missing priority elements in the development and implementation efforts of wastewater strategies/policies and/or Action Plans and (e) suggested recommendations and proposed policy options to enhance the development and integration of wastewater national strategies into national water plans.

The study was followed by a one-day national consultation, involving all stakeholders. The workshop was held on the occasion of presenting the draft Review Report and aimed at (a) reviewing and validating the findings with the country's stakeholders; (b) obtaining guidance to ensure that the priorities, policy options and recommendations proposed by SWIM,

⁴ The situation in spring 2012 is that cooperation with Syria is temporarily suspended until further notice from the EU

⁵ The list of the participants represents the registrations of all the people including those who accompanied the high officials during the inauguration.



address current and future needs of the country with an emphasis on bridging the gaps and (c) helping establish/facilitate a structured national dialogue among high level officials from the relevant sectors to advance the wastewater strategy/policy/action plan formulation and implementation in the country.

2. Workshop Methodology

In order to achieve the workshop's objectives, the workshop was designed to be highly dynamic, interactive, using workgroups as a basis for participation to ensure that input is captured from all participants. **However, the national partners requested that discussions are made in plenary.** Accordingly, the approach was modified on the spot and included, in addition to the Power point presentations on the outcomes of the SWIM-SM Review, facilitated roundtable discussions and interventions from the SWIM Key and non-key experts to bring regional and international experience into perspective.

3. Overview of the Workshop Agenda

The workshop was held over one day (11 March, 2013) as per the detailed Agenda in Section 7 of this report. The agenda consisted of:

- 1) Opening Remarks, and introduction to the workshop's background and objectives;
- 2) Presentations of the country's assessment in two parts: (a) main findings of the country's review of the status of development and implementation of wastewater strategies/policies/and/or action plans including progress and achievements and Challenges, constraints and gaps (b) presentation of the opportunities for advancing missing priority elements in the Strategy development and implementation efforts of the proposed priorities, policy options and recommendations to address current and future needs. Each presentation was followed by round-table discussion.

Due to the fact that the workshop was facilitated in plenary discussions, rather than workgroups, the deliberations took more time in order to ensure that all official opinions are considered. Furthermore, more detailed presentations had to be provided by the non-key expert, to accommodate the last minute registrations involving participants who did not receive a copy of the assessment report prior to the workshop. The draft report was sent only to a small percentage of participants who registered online ahead of the event. As a result, the day ended with the presentation of the recommendations at five pm (instead of 4 pm).

All participants were provided with electronic copies of all presentations and the draft report.



4. Main Outcomes of the Discussions

On the institutional framework, governance, policies and strategies and Progress and achievements

- The main challenges facing the water sector in Egypt are: (a) High population growth rate; (b) Increasing standard of living resulting in increased water uses; (c) limited water resources; (d) Deterioration in irrigation/drainage infrastructure; (e) water pollution due to the discharge of untreated industrial and domestic waste water and agricultural drainage water, which reduce the availability of good quality water; (f) climate change and (g) Political instability as a result of the on-going demonstrations demanding openness, transparency and dialogue.
- The annual per-capita water availability of less than 700 m³ has put Egypt in the list of countries suffering from water stress. This is steadily increasing due to the strong growth in the population and the competing demands; with agriculture consuming more than 80% of the annual volumes of water used. All available water is being used, thus necessitating looking for opportunities to increase water resources availability, improving efficiency of water systems, rationing water demands and utilisation of nonconventional water including treated wastewater reuse.
- Urban coverage with improved sanitation increased from 45% in 1993 to 56% in 2004, reaching 100% in urban and 40% in rural areas by the end of 2012.
- There are three committees that are involved in planning state policies; (1) the higher water committee for the Nile Water, (2) the higher water committee for the follow up on the national water resources plan and (3) the higher water committee for the protection of the environment.
- The present state of lack of security in the country is resulting in increasing number of violations to the laws and regulations involving discharging pollutants into the Nile and illegal withdrawals from its water.
- The most important laws regarding water and environment in Egypt are the Irrigation and Drainage Law (Law 12/1984) regulating the use of water including groundwater and Law 48/1982 for the Protection of the River Nile and Waterways from pollution, in addition to the Ministerial decree “380” in 1982 for the Protection of the environment against industrial pollution.
- The reuse of treated wastewater is becoming increasingly important in water resources management in Egypt for both water and environmental sustainability and economic reasons. This was ascertained in the Egyptian code of practice (ECP) 501/2005 (which defines the standards for reuse in agriculture).
- On the regulations related to the private partnership, a new law was issued in 2010 (No. 67/2010) regulating the Partnerships with the Private Sector in Infrastructure Projects, Services and Public Utilities. The law also established the Public Private Partnership Central Unit at the Ministry of Finance (PPPCU).
- Water problems in Egypt are becoming the focus of attention at the highest level.



- The President launched an initiative to involve Non-governmental Organisations (NGOs) in the conceptualization of development in Egypt, including the development of water resources.
- There is one paragraph on water in the new Egyptian constitution.
- A Rural Sanitation strategy is being prepared and will be ready for review.
- A new Water Law has been prepared and is expected to be submitted for approval to the people's council
- Tariff on WW has been included in the water bill, in addition to a program for licensing and certification of WWTP for Technical Sustainable Management (TSM).

On Constrains, Challenges and Gaps

Rural Sanitation:

- Rural sanitation is lagging way behind urban sanitation in the country, posing a big challenge for the wastewater sector in Egypt. The current approach in dealing with sanitation involves high costs and technological challenges and the subsequent economic and financial challenges to maintain and sustain such technologies.
- Sanitation in both the rural and urban areas in each governorate falls under the responsibility of the Holding Company for Water and Wastewater and the respective affiliated company in that governorate.
- The low coverage in rural sanitation, in combination with sub-optimal treatment, results in serious problems of water pollution and degradation of health conditions as the majority of villages and rural areas discharge their raw domestic wastewater directly into the waterways. This necessitates more concerted efforts to provide sanitary and wastewater services in the rural areas as a priority, which represents more than 56% of the population in Egypt. Issues to be considered included:
 - The level of treatment: There were suggestions to concentrate on primary treatment throughout the country including the rural areas. However, the risks associated with such level of treatment are high, especially if not accompanied with on-site reuse and awareness-raising among the users. Reuse in the plantation of trees that are allowed to be grown with wastewater treated to primary level, is particularly practical in remote villages where access to sizeable lands does not pose a problem. Reuse in man-made forests in the marginal desert land should consider economic exploitation of treated wastewater (for example in the plantation of industrial oil crops for the generation of biofuel) and quick financial returns from these forests.
 - Options for the institutional framework that should be put in place to extend the rural sanitation coverage included the possibility of establishing a national body under the responsibility of the Ministry of Water and Wastewater Utilities to be completely in charge of the rural sanitation portfolio including all its



financial and institutional requirements (similar to what happened in the electricity Sector; Authority of Rural Electricity). Another option is to decentralize through the establishment of a dedicated sector for the sanitation projects within each water and wastewater company. No matter what the option is, there is a strong need to define the institutional framework and clearly identify the roles and responsibilities of each institution and means of coordination. This should be accompanied with:

- changing laws and regulations to enable institutional and regulatory reform, which takes usually a lot of time,
- standardization of sanitation systems that can be used in the remote areas and provision of adequate training,
- changing the focus of the Holding company from the construction and management of regional sewerage systems to the construction and management of decentralized wastewater treatment facilities. This should be based on revised policies that decide the size of the towns for which centralized treatment would be effective.

Wastewater Reuse

- The Egyptian Code for sanitation complies with international standards and the new strategy (2050 National Strategy for Development and Management of Water Resources) considers reuse as an option for increasing water resources availability. However, the standards for reuse are highly restrictive.
- The information related to wastewater reuse in the report should be revised to include the latest development. Since more than a year the Holding company started modifying the ECP 501/2005 related to the reuse of treated wastewater in irrigation. The modification includes the identification of the types of crops that can be used with the different levels of treatment and which have high returns. The revised version of the code will be published soon.
- The USAID did a study on wastewater reuse which indicated that the major challenge in this area is to introduce public private partnership to enable the involvement of the private sector in the construction, the operation and maintenance (O&M) of treatment plants and reuse in high value plantations and exports.
- Reuse of treated wastewater should be as near as possible to the wastewater treatment plant (should be careful with the economic aspects of transferring treated wastewater) Since the private sector is looking after profit, involvement of the private sector in small wastewater treatment projects is not efficient.
- The current legislative, regulatory and institutional environment is not conducive for reuse. Information and awareness are also lacking.



- The discharge of untreated industrial waste into the sewerage network reduces the efficiency of the wastewater treatment plants in the country, and affects the final quality of the effluent, which further limits the possibilities for irrigation. Segregation of industrial wastewater from municipal wastewater was proposed.
- The HCWW should consider in its current revisions of the ECP 501/2005 introducing reuse of treated wastewater in the plantation of industrial oil crops and the crops used in the production of biofuel and cosmetics, which have high economic potential and are safe to use in end products; being exposed to high temperature during manufacturing;
- There is a strong need to invest in scientific research to find alternative low treatment cost solutions that can suit the varying conditions within the country.

Sludge Management

- Despite its potential benefits, the use of sludge in Egypt is not as well addressed as reuse. The standards are very restrictive. Experimentation with the use of sludge in the production of compost is carried out by Greater Cairo Wastewater Company.
- Creating the adequate institutional, technical and legislative framework has to be implemented. Logistical challenges related to sludge management include storage and commitment to store. Developing plans for WWTP sludge management in each governorate should be possible if the amount of available sludge is known and the governorates are committed to its storage. Arrangements for its sale can be made through contracts with target industries such as the cement industry where it can be used as fuel.

Industrial Wastewater

- In order to meet the EU regulations for export, the large industries are eco-certified and are using closed-loop system involving treatment and recovery of treated wastewater that promotes the conservation of water. The problems in industrial wastewater are therefore mostly related to small and medium industries, which discharge into water ways and sewerage networks. For those, the biggest challenge is enforcement of applicable laws to ensure compliance of the industrial wastewater with the quality requirements for discharge into the sewerage network or water bodies. Improving compliance and enforcement capacity is therefore needed.
- Equally important challenge is the quality of agricultural drainage (high in ammonia, etc.). Treatment of agricultural drainage prior to discharge into water ways should be contemplated.
- There is a need to define a system to economically treat industrial wastewater. One option is the segregation of industrial wastewater from municipal wastewater. The current approach in the country is favouring the establishment of central wastewater treatment plants in the industrial complexes. This however should involve sector approach for each type of industrial processes, and requires multi-sectorial coordination (with the Ministries of environment, Irrigation, etc).



Governance

- There was a discussion on the concept of centralisation. It was argued that the HCWW affiliated companies represent a good example on decentralisation; being responsible for the preparation of its own plans and having a general assembly and its own board of directors. Decentralisation however requires financial autonomy and means for self-financing.
- CAPW includes Greater Cairo that encompasses Kalyoubia and 6 October governorates (not just Cairo).

Participative Management

- The root cause behind lack of participation is mainly related to the absence of this culture in the country, and loss of confidence between the citizen and the service providers as a result of un-kept promises. This is why the Ministry of Water and Wastewater Utilities is now favouring not to publicize for any sanitation project before actual implementation. In order to build trust with the customers the HWWC established customers' complaints and service centres, and awareness departments which regularly implement customers' satisfaction surveys.
- Participation should not be voluntary. The government has abandoned all aspects of awareness raising and dissemination of information. However the situation after the revolution requires that participation is embedded in all aspects of water and wastewater development - from the initiation of plans all the way to implementation. This is referred to as upstream approach versus downstream approach.
- Participatory approach requires integrated policy involving information and awareness raising and training of stakeholders at the downstream and upstream end of the development.

Pricing and Cost Recovery

- Noncompliance with Standard Operation Procedures leads to over-cost of O&M, thus increasing the gap between revenues and expenses.
- Despite the awareness of the unsustainability of providing water at almost nominal prices, that fails to cover O&M costs, the issue of pricing is becoming a very big challenge, especially under the current situation.

Private Sector Participation

- Opportunities for private sector interests in the wastewater sector include the management of networks and WWTP, sludge management, reuse of wastewater. This however requires a strong enabling environment to attract investors and safeguard them from financial risks, to say the least.



Monitoring network and databases

- The most important challenge is related to the multiplicity of organisations involved in the water and wastewater sector; each collecting its monitoring data and administering its own databases. Coordination has to be created between the institutions through the institutionalization of operational procedures or data transmission. This requires however consolidation of databases and identification of the authorized source of information in each domain.

On Opportunities

- Technological opportunities include the introduction of microfiltration membrane and bioreactors (MBR) as upgrades to existing WWTPs; that would improve the quality of effluent.

5. Conclusions and Recommendations

A set of recommendations were presented by the consultant. However due to the lack of time and in order ensure full sensitization of the outcomes of the discussions, the participants proposed to the SWIM team to draft and share the list of action oriented recommendations in bullets within a week. Comments that will be received from the participants shall be incorporated in the final report for official dissemination.

6. Workshop Evaluation findings and recommendations

At the end of the workshop, the participants filled an evaluation form to express their opinion and feelings about the efficiency, effectiveness and soundness of both the organization and delivery of the training. The forms were thereafter analysed to extract lessons and recommendations for future activities. Below is a summary of the evaluation findings and main feedback from the participants.

Organizational and administrative issues before and during the workshop

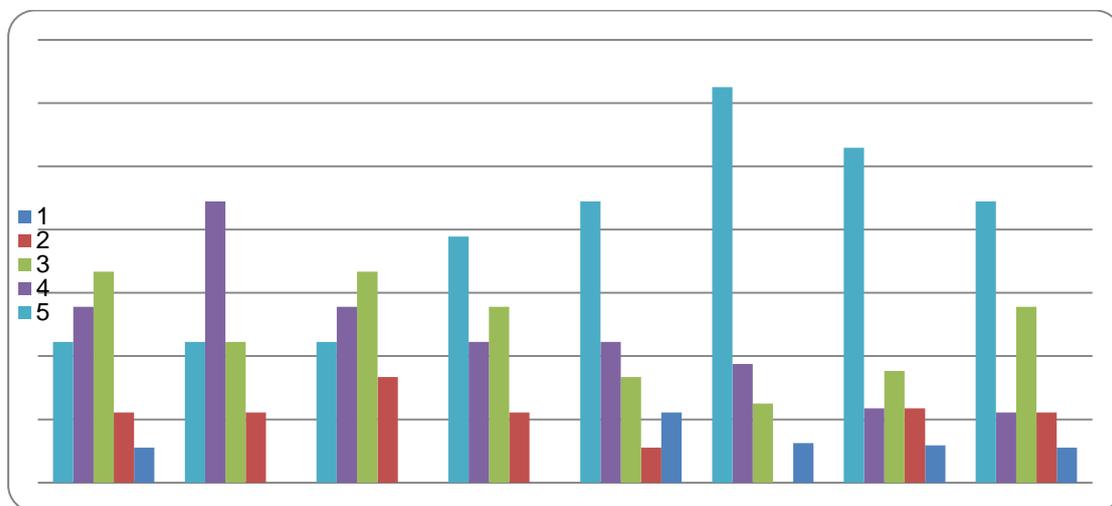
As depicted in the chart below, a set of 8 criteria; A1-A8 (See table below) were assessed by the participants, using a scoring scale from 1 to 5, with 1= "Strongly disagree" or the lowest, most negative impression and 5="strongly agree", or the highest, most positive impression.

Table 1: List of criteria A1-A8

A1	Good Handling of Invitations, Visa Support, Information Sharing and Smoothing Obstacles
A2	Smooth flow of programme, efficient handling of emerging needs and attentiveness to participants concerns
A3	Efficient Logistics: Accommodation, Transportation, Tools and Equipment
A4	Efficient and Effective Communication of Objectives, & Expectations from Participants



A5	Efficient and Effective Follow-up of Preparations and Progress towards the Event
A6	Clarity, Coverage and sufficiency of concepts, Objectives, anticipated outputs and outcomes
A7	Procedural issues: Selection and Design of Methodology, Programme/Daily Agenda and Work Rules
A8	Presentations Correspond and contribute to the Planned Objectives and Conducive to Enhanced shared Understanding and participation of Relevant Issues



Overall, impression of participants was positive to very positive (70 % to 86 % on average) on most aspects related to the course organization, administration as well as design and contents. However, some low scores were registered due to complaints about the quality of the microphones, accessibility to the organisers by email only, insufficient time to read the report, and frustration about the report being in English. The fact that there were last minute requests from the national partners regarding interpretation to Arabic resulted in last minute arrangements not only for interpretation, but also for translation of the hand outs to Arabic, which resulted in some delays in their distribution to the participants. Furthermore, there were a lot of walk-ins from representatives which did not register or confirm their participation. Hence they did not get a copy of the report.

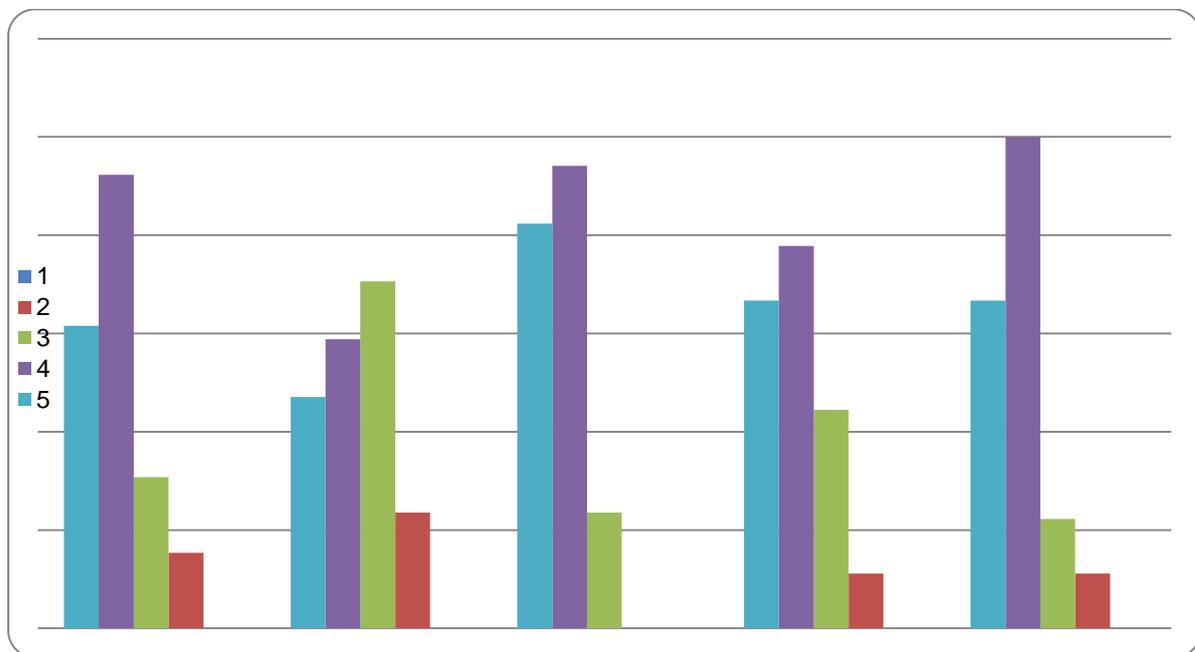
Executing the workshop

The same scoring scale was used to assess another set of criteria; B1-B5 (See table below) related to the execution of the workshop.



Table 2: List of criteria B1-B5

B1	Efficient and Effective Performance and Interaction by Participants
B2	Efficient and Effective Facilitation
B3	Efficient and Effective Cooperation and Team Spirit
B4	Acceptable Level of Achievement of Planned Objectives
B5	Positive Overall Impression On the Personal Level of Participants



Similarly, the participants' feedback was encouraging with a large majority giving 4-5 scores to issues such as performance and interaction, quality of facilitation and team spirit. However, the level of satisfaction with achieving the workshop objective was satisfactory to very satisfactory for 53% of the participants. About 35% did not particularly agree or disagree to that. This is due to the last minute registrations (thus attending the workshop without knowing sufficiently about it) and lack of fluency in English.

Personal impression and recommendations

Participants were invited to express themselves on the aspects that they have liked the most and their recommendations for improvement in the future. Below is a summary of the findings:



Most liked things	Suggestions for improvement
<ul style="list-style-type: none"> ➤ Accomodation, service, participation ➤ Diversity of participants ➤ Participating in the event 	<ul style="list-style-type: none"> ➤ Provide access to the administrator through mobile (for emergency) ➤ Invite consultants and university professors ➤ Translate report to Arabic ➤ Distribute report at least one week in advance ➤ Improve the quality of interpretation equipment

7. Detailed Workshop Agenda

- 9:00-9:30 Registration
- 9:30-10:00 Session I: Workshop Opening
- Welcome and opening statements:
 - H.E the Minister of Drinking Water and Sanitation Facilities
 - Dr. Essam Khalifa; Sector Head, Minister’s Office at the Ministry of Water Resources and Irrigation (also SWIM Focal Point in Egypt)
 - Dr. Ahmed Bader; Water and Energy Sector Manager, EU delegation and
 - Professor Hosny Khordagui; SWIM team leader
 - Introduction and orientation by task leader (Key Expert SWIM-SM)
- 10:00-11:45 Session II: Country Assessment
- Presentation of the Country’s Assessment - Part 1 (30 mins) (NKE)
 - ✓ General overview of the status of development and implementation of wastewater strategies/action plans/ policies
 - ✓ Progress and achievements
 - ✓ Challenges, constraints and gaps
 - Comments and Discussion of the Findings – Thematic⁶ Workgroups (45 mins)
 - Presentation of results (30 min)
- 11:45-12:10 Coffee Break (25 mins)
- 12:10-13:40 Session III: Bridging the Gaps

⁶ (a) Enabling Environment (2workgroups), (b) Governance and Institutional Framework (2workgroups), and (c) Management Instruments (2workgroups)



- Presentation of the Country's Assessment - Part 2 (30 mins) (NKE)
 - ✓ Opportunities for advancing missing priority elements in the Strategy development and implementation efforts
 - ✓ Proposed priorities, policy options and recommendations to address current and future needs
 - ✓ Comments and discussions (60 mins) – Six thematic¹ workgroups (priorities, policy options and recommendations)

13:40-14:40 Lunch

14:40-15:40 Discussions (Continued):

- Presentation of results (30 min)
- Plenary Discussions (30 min)

15:40-16:00 Wrap up and closing remarks



8. List of Participants

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1	Mr Abdul Mohsen	ABDEL BAKY MOUSTAFA	Chairman, managing Director	Alexandria Sanitarian Drainage Co	mohsenbaky@hotmail.com
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23	Mr Mahmoud	FOUAD	Chairman	Kafr El_Shaikh Company.	
24	Mr Mohammad	HASAN	Executive manager	Egyptian Water and Wastewater Regulatory Agency (EWRA)	
25	Mr Andre	HOEIJMAKERS	Team Leader: Improving the capacity of the Holding Company for Water and Wastewater (HCWW)	VNG international	andrehoeijmakers@gmail.com



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